

CLAIMS:

1. An exhaust treatment device, comprising:
a substrate;
a catalyst layer deposited on the substrate, the catalyst layer comprising a first catalyst metal and a second catalyst metal, wherein greater than or equal to about 70 wt% of the first catalyst metal and the second catalyst metal is non-alloyed under alloying conditions, wherein the weight percent is based on a combined weight of the first catalyst metal and the second catalyst metal; and
wherein the first catalyst metal and the second catalyst metal are different and individually selected from the group consisting of platinum, palladium, rhodium, iridium, rhenium, ruthenium, and osmium.
2. The exhaust treatment device of Claim 1, wherein the first catalyst metal is palladium and the second catalyst metal is rhodium.
3. The exhaust treatment device of Claim 2, wherein greater than 90 wt% of the first catalyst metal and the second catalyst metal is non-alloyed.
4. The exhaust treatment device of Claim 3, wherein greater than 95 wt% of the first catalyst metal and the second catalyst metal is non-alloyed.
5. The exhaust treatment device of Claim 2, wherein a weight ratio of the palladium to the rhodium is less than or equal to about 20:1.
6. The exhaust treatment device of Claim 3, wherein the ratio is about 3:1 to about 15:1.
7. The exhaust treatment device of Claim 1, wherein the catalyst layer further comprises an aluminum oxide and an oxygen storage component, wherein the aluminum oxide and the storage component have average pore diameters of about 150 Å to about 1,000 Å.

8. The exhaust treatment device of Claim 7, wherein about 50% to about 80% of the pore volume, based on the total pore volume comprise pores having average pore diameters of about 180 Å to about 800 Å.

9. The exhaust treatment device of Claim 7, wherein the aluminum oxide comprises gamma aluminum oxide.

10. The exhaust treatment device of Claim 7, wherein the oxygen storage component comprises cerium.

11. The exhaust treatment device of Claim 7, wherein the oxygen storage component is represented by the formula $(\text{Ce}_a\text{Zr}_b\text{La}_c\text{Y}_d\text{Pr}_e\text{O}_x)$, wherein subscripts a, b, c, d, e, and x, represent atomic fractions, and wherein $a + b + c + d + e = 1$.

12. The exhaust treatment device of Claim 11, wherein the oxygen storage component comprises $\text{Ce}_{0.376}\text{Zr}_{0.50}\text{La}_{0.086}\text{Pr}_{0.038}\text{O}_{1.95}$ or $\text{Ce}_{0.25}\text{Zr}_{0.65}\text{La}_{0.04}\text{Y}_{0.06}\text{O}_{1.95}$.

13. The exhaust treatment device of Claim 7, wherein the oxygen storage component has a stable cubic structure.

14. A method of making an exhaust emission control device, the method comprising:

mixing a palladium salt, a rhodium salt, an aluminum oxide, and an oxygen storage component together to form a slurry;

depositing the slurry on a substrate to form a washcoat;

calcining the washcoat plus substrate to form a catalyst layer on the substrate, wherein greater than or equal to about 70 wt% of the palladium and rhodium in the catalyst layer is non-alloyed under alloying conditions, wherein the weight percent is based on a total weight of the palladium and rhodium in the catalyst; and

disposing the calcined substrate in a housing.

15. The method of Claim 14, wherein greater than 95 wt% of the first catalyst metal and the second catalyst metal is non-alloyed.
16. The method of Claim 14, wherein a weight ratio of the palladium to the rhodium is less than or equal to about 20:1.
17. The method of Claim 16, wherein the ratio is about 3:1 to about 15:1.
18. The method of Claim 14, wherein the catalyst layer further comprises an aluminum oxide and an oxygen storage component, wherein the aluminum oxide and the storage component have average pore diameters of about 150 Å to about 1,000 Å.
19. The method of Claim 18, wherein about 50% to about 80% of the pore volume, based on the total pore volume, comprise pores having average pore diameters of about 180 Å to about 800 Å.
20. The method of Claim 18, wherein the aluminum oxide comprises gamma aluminum oxide.
21. The method of Claim 18, wherein the oxygen storage component comprises cerium.
22. The method of Claim 18, wherein the oxygen storage component is represented by the formula $(\text{Ce}_a\text{Zr}_b\text{La}_c\text{Y}_d\text{Pr}_e\text{O}_x)$, wherein subscripts a, b, c, d, e, and x, represent atomic fractions, and wherein $a + b + c + d + e = 1$.
23. The method of Claim 22, wherein the oxygen storage component comprises $\text{Ce}_{0.376}\text{Zr}_{0.50}\text{La}_{0.086}\text{Pr}_{0.038}\text{O}_{1.95}$ or $\text{Ce}_{0.25}\text{Zr}_{0.65}\text{La}_{0.04}\text{Y}_{0.06}\text{O}_{1.95}$.
24. The method of Claim 18, wherein the oxygen storage component has a stable cubic structure.

25. An exhaust treatment device, comprising:

a substrate;

a catalyst layer deposited on the substrate, the catalyst layer comprising palladium, rhodium, an aluminum oxide, and an oxygen storage component, wherein the aluminum oxide and the storage component have average pore diameters of about 150 angstroms to about 1,000 angstroms, wherein about 50% to about 80% of the pore volume, based on the total pore volume comprise pores having average pore diameters of about 180 angstroms to about 800 angstroms, wherein greater than or equal to about 70 wt% of the palladium and rhodium is non-alloyed under alloying conditions, wherein the weight percent is based on a combined weight of the palladium and the rhodium;

a retention material disposed around the substrate to form a subassembly; and

a housing disposed around the subassembly.